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Claims

B1 1. A wave device for supporting electromagnetic waves,  
the device including:

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a first pair of inputs for setting up a first  
standing wave therebetween;

10 a second pair of inputs for setting up a second  
standing wave therebetween and positioned such that the  
input signal of each of the first and second pairs of  
inputs is unaffected by the state or impedance of the  
other of the first and second pairs of inputs; and

15 an output positioned so as to receive power from  
both the first and second standing waves. (Where is the  
output in the fig.)

2. A wave device according to claim 1 including a  
conductive plate for supporting the first and second  
standing waves.

20 3. A wave device according to claim 2 wherein the plate  
is mounted parallel to a grounded structure and is  
separated from the grounded structure by a dielectric.

25 4. A wave device according to claim 3 wherein the  
device is constructed as a microstrip structure or a  
stripline structure.

30 5. A wave device according to claim 2, 3 or 4, wherein  
the plate is a polygon having an even number of sides and  
each respective pair of inputs is connected across an  
opposing pair of sides.

35 6. A wave device according to claim 2, 3 or 4, wherein  
the plate is circular and each respective pair of inputs  
is connected to the plate across a diameter of the plate.

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7. A wave device according to any preceding claim wherein the output is positioned at substantially the antinode of the device.

8. A wave device according to any preceding claim wherein the distance between a pair of inputs equals an integer number of the wave length of the wave transmitted by the inputs.

10 9. A wave device according to any preceding claim further comprising power dividers for providing the pairs of inputs from the signal sources.

15 10. A wave device according to any preceding claim further comprising one or more additional pairs of inputs for setting up additional respective standing waves.

20 11. A method of operating the wave device of any preceding claim as a splitter, the method providing a power input at the output of the wave device and receiving divided power output from the first and second pairs of inputs.

25 12. A method of combining electromagnetic waves comprising:

arranging a first pair of inputs across a wave device so as to set up a first standing wave therebetween;

30 arranging a second pair of inputs across the wave device so as to set up a second standing wave therebetween such that the input independence of each of the first and second pairs of inputs is unaffected by the other of the first and second pairs of inputs; and

35 arranging an output at a position on the wave device so as to receive power from both the first and second

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